



California Regional Water Quality Control Board

Santa Ana Region



Alan C. Lloyd, Ph.D.
Agency Secretary

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Arnold Schwarzenegger
Governor

April 19, 2006

Mr. Timothy Haltmeyer, Manager
Environment, Health, Safety and Medical
Northrop Grumman Corporation
One Hornet Way, PA12/W9
El Segundo, CA 90245

GROUNDWATER REMEDIATION PLAN – CLEANUP AND ABATEMENT ORDER (CAO) NO.
R8-2003-108, FORMER NORTHROP GRUMMAN CORPORATION (NGC) Y-12 FACILITY, 301
ORANGETHORPE AVENUE, ANAHEIM, CA

Dear Mr. Haltmeyer:

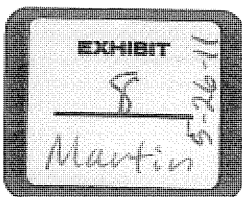
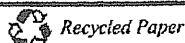
URS Corporation (URS), on behalf of Northrop Grumman Corporation, submitted a Groundwater Remediation Plan (GRP) dated October 13, 2004 for the former Northrop Grumman Corporation Y-12 facility. After the GRP was submitted, we had informed Northrop representatives that our response was pending based on further evaluation of our concern that the GRP did not address the shallow portion of the uppermost regional aquifer.

The GRP states that eight potential remedial alternatives were screened to remediate the volatile organic compounds (VOCs) in the vadose zone soil and the semi-perched groundwater, and two alternative technologies for remediation were selected for further evaluation: 1) No action and 2) Soil vapor extraction/multi-phase extraction. URS considered the nine criteria for feasibility studies as defined in the USEPA National Oil and Hazardous Substances Pollution Contingency Plan (1990), the volatile organic compound (VOC) concentrations in the soil and groundwater, and the lithologic and hydrogeologic conditions at the site, and selected soil vapor extraction/multi-phase extraction (SVE/MPE) as the appropriate remedial technology to clean up the shallow soil and semi-perched groundwater at this site.

URS has proposed installation of several nested SVE and MPE wells (the number of wells has not yet been determined). The wells will be connected via a system of pipes and pumps to a vacuum system, blowers and air-water separators. The groundwater and vapor will be treated using canisters containing granular activated carbon (GAC). Screened intervals for both types of wells will be selected to address the different lithologies and to minimize the preferential flow of vapor through the high permeability soil layers.

According to the workplan, the groundwater elevation and dissolved phase VOC concentrations in each well will be monitored during start-up and throughout the operation of the remediation system. Treated groundwater may be discharged to the sanitary sewer system under a permit from the Orange County Sanitation District, or discharged to the storm drain and monitored according to a National Pollutant Discharge Elimination System (NPDES) Permit. The SVE/MPE system will be operated until the remediation is deemed complete, as determined in conjunction with Board staff. At the end of this operation period, a report and recommendations will be submitted to Board staff for review. The soil venting system will be monitored and operated in accordance with South Coast Air Quality Monitoring District's Authority to Construct and Permit to Operate conditions.

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URS has proposed to conduct a pilot test to obtain performance data that will be used to optimize the design of the full-scale system. URS proposes to use monitoring well NMW-2A as the focus well for the pilot test, with three new wells, NMW-11, NMW-12 and NMW-13, to be installed at distances of 10, 30 and 60 feet from NMW-2A. Wells screened in the upper soil intervals, from 30 to 70 feet below ground surface (bgs), will be used to test permeable soils in the upper vadose zone and monitor the SVE, while wells screened in the lower intervals, 80 to 95 feet bgs, will target the semi-perched groundwater and vadose zone soils. URS has proposed a 3-hour pilot test to evaluate the conditions at the site.

As noted above, the GRP proposes to remediate VOCs in the vadose zone soil and the semi-perched groundwater, and does not intend to address the uppermost regional aquifer. The semi-perched groundwater is present at about 80 to 95 feet bgs and the uppermost regional aquifer is encountered at a depth of about 110 feet bgs. The semi-perched groundwater occurs at the site in small discontinuous lenses within the predominantly clay interval between about 80 and 110 feet bgs. Board staff informed Northrop as early as 1997 that remediation of the uppermost regional aquifer was necessary. In our February 20, 1997 letter, Board staff stated (1) "It appears that the so called "clay confining layer" does not provide an adequate barrier to hydraulic communication between the uppermost water bearing zone and the lower water bearing zone", (2) "Investigations at the site indicate that high concentrations of chlorinated volatile organic compounds, mostly TCE, exist in both the uppermost water bearing zone (90 to 107 bgs) and the lower water bearing zone (below 107 bgs)", (3) "The recently installed monitoring wells were all screened in the lower water bearing zone (from about 110 ft bgs to 125 ft bgs)", and (4) "The high level of VOCs in groundwater in the "uppermost and lower water bearing zones" act as a continuing source of additional VOCs impact to groundwater quality in the area. These additional impacts to water quality from the site must be mitigated."

Recent groundwater monitoring results further substantiate the need to provide remediation of the shallow portion of the uppermost regional aquifer. TCE has generally ranged from about 50 ppb to about 120 ppb in NMW-2 from 2000 through 2004. In the two sampling events during the first two quarters of 2005, TCE was detected at 370 ppb and 260 ppb. In the two sampling events during the last two quarters of 2005, TCE was detected at 1100 ppb and 1000 ppb. Considering similar increases in PCE and 1,1-DCE that occurred, total VOCs in NMW-2 are currently about 1,500 ppb. NMW-2 is screened from 110 to 125 feet bgs, in the uppermost regional aquifer. It is evident that VOCs are continuing to impact the uppermost regional aquifer at significant concentrations. The removal of VOCs from the uppermost regional aquifer at the site is necessary to prevent VOCs from migrating further downgradient in the uppermost regional aquifer. Therefore, the GRP must address the uppermost regional aquifer.

The GRP states that the selected remedial alternative will address the "site soils and semi-perched groundwater impacted with VOCs at the site." Although the GRP states that a pilot test will be conducted to obtain performance data for use in design of a full-scale system, the GRP does not describe the lateral extent of soil or groundwater that is ultimately intended to be remediated. NMW-2A and NMW-2 are located about 240 feet downgradient of the location of the former degreaser, and about 60 feet upgradient of the property line. Detailed investigations have not been conducted in this general area to determine the lateral extent of the VOCs in soil and groundwater in order to delineate the area in need of soil and groundwater remediation. Although the monitoring wells located about 850 feet generally downgradient of NMW-2A and NMW-2 do not exhibit VOCs in concentrations that justify the need to construct a groundwater extraction system at that location, considering the higher concentrations of VOCs found currently and historically in NMW-2A and NMW-2, it is evident that VOCs in concentrations that justify remediation occur at some unknown distance in the semi-perched groundwater and the shallow portion of the uppermost regional aquifer downgradient of NMW-2A and NMW-2.



We concur with the pilot test portion of the GRP to obtain performance data for use in design of a full-scale system to address vadose zone soil and the semi-perched groundwater. However, we have the following comments:

- The GRP must be revised to address the shallow portion of the uppermost regional aquifer. As you are aware, one of the groundwater extraction wells associated with the Orange County Water District's proposed North Basin Groundwater Protection Project is expected to be located about 2,500 feet directly downgradient of the former Northrop facility. We understand that Northrop and the Orange County Water District are currently in discussions regarding the extent to which Northrop may participate in that project in order to address the VOCs from the former Northrop facility that will be removed by Orange County Water District's proposed extraction well and treatment facilities. However, the source area at the site, consisting of the vadose zone soil, semi-perched groundwater and the shallow portion of the uppermost regional aquifer, must be effectively remediated so that it does not act as a continuing source of VOCs.
- The GRP must be revised to clearly delineate the lateral extent of the area that is intended to be addressed by the remediation system. Since insufficient data exists to clearly delineate the area at and downgradient of the location of the former degreaser that will require remediation, the area described for remediation in the revised GRP must be large enough to clearly encompass the lateral extent that VOCs could be present in the vadose zone soil, semi-perched groundwater and uppermost regional aquifer from the location of the former degreaser to the area at, and immediately downgradient of, the boundary of the site. As an alternative, acquiring additional soil and groundwater data can be proposed to justify a smaller area for remediation.
- Based upon our collective experience with similar projects, it is common practice to run the pilot extraction test for a minimum of eight hours. Therefore, we recommend that an 8-hour test be conducted at this site. This longer time period is usually necessary to allow adequate time for the system to be brought to full operational conditions, and to adequately monitor the vacuum being applied. The applied vacuum and the vapor flow rates should be monitored at fixed time intervals, and a data plot drawn to determine the optimum extraction rates that will be needed to run the system. After the pilot test has been completed, a report must be submitted to Board staff, summarizing the results and evaluating the pilot test data. Full-scale design drawings showing locations of the extraction wells, treatment system, and other details of the remediation system are to be submitted for review by Board staff, prior to final construction.

Please submit a revised GRP by May 31, 2006. If you have any questions, please contact Maneck G. Chichgar, Project Manager, at (951) 782-3252, or you may call Robert Holub, Supervising Engineer, at (951) 782-3298.

Sincerely,

K. J. Thibeault

for Gerard J. Thibeault
Executive Officer

cc: Norbert Schulz, URS
Dave Mark, OCWD

C:/Data/NorthropY-12/Comments GW Remed Plan

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